

January 19, 1999

Mr. R. P. Powers
Senior Vice President
Nuclear Generation Group
American Electric Power Company
500 Circle Drive
Buchanan, MI 49107-1395

SUBJECT: NRC INSPECTION REPORTS 50-315/98023(DRS); 50-316/98023(DRS)

Dear Mr. Powers:

On December 11, 1998, the NRC completed Phase 1 of the Restart Readiness Assessment Team Inspection at your Donald C. Cook Nuclear Energy Center.

Since completion of Phase 1, you requested delay of Phase 2 of this inspection. Initiation of the remainder of the inspection is on hold pending your development of a Restart Schedule in May 1999. The focus of Phase 1 was to evaluate the adequacy of your emergency operating procedures and the corrective actions taken to address previously identified weaknesses in your licensed operator training programs. The inspection also included a review of activities implemented in accordance with your Cook Restart Action Plan. During the inspection the team reviewed emergency operating procedures, observed the performance of two operating crews during dynamic scenario continuing training evaluations conducted by your training and operations management and staff, and attended continuing operator training lectures. The team also reviewed changes implemented, and planned, for your licensed operator training programs.

The team identified a marked improvement in developing technically accurate written examinations, operator's making correct protective action recommendations, and preparing applicants to take an initial license examination. However, during the steam generator tube rupture training scenario observed in the simulator, the team identified concerns with the operator's lack of understanding of the mitigating strategies and the quality of training materials specific for this scenario. Contributing factors were lack of procedural guidance for early isolation of auxiliary feedwater and operator anticipation of the steam generator fill rate. Further, during that scenario, and also during the scenario involving loss of all AC power, the team determined that crew communications and shift briefings were areas needing improvement.

The emergency operating procedure changes and supporting documentation planned for plant restart were still undergoing revision and licensee review during the inspection. Consequently, the inspectors were not able to assess the quality of those documents. Supporting documentation for the existing emergency operating procedures was inadequate.

Based on the performance problems observed during the simulator scenarios, combined with the lack of adequate documentation for the emergency operating procedures, the team

questioned the readiness of the operators to support plant restart. Additional efforts appear warranted to insure that the operations staff is properly prepared to support plant restart through training and the consistent reinforcement of good operating practices.

In accordance with 10 CFR 2.790 of the Commission's regulations, a copy of this letter and the enclosures to this letter will be placed in the NRC Public Document Room.

We will gladly discuss any questions you have concerning this examination.

Sincerely

Original /s/ J. A. Grobe

John A. Grobe, Director
Division of Reactor Safety

Docket Nos.: 50-315; 50-316
License Nos.: DPR-58; DPR-74

Enclosure: Inspection Reports 50-315/98023(DRS); 50-316/98023(DRS)

cc w/encl: J. Sampson, Site Vice President
M. Rencheck, Vice President, Nuclear Engineering
D. Cooper, Plant Manager
R. Whale, Michigan Public Service Commission
Michigan Department of Environmental Quality
Emergency Management Division
MI Department of State Police
D. Lochbaum, Union of Concerned Scientists

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U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket Nos: 50-315; 50-316
License Nos: DPR-58; DPR-74

Report Nos: 50-315/98023(DRS); 50-316/98023(DRS)

Licensee: American Electric Power Company

Facility: Donald C. Cook Nuclear Generating Plant, Units 1 and 2

Location: 500 Circle Drive
Buchanan, MI 49107-1395

Dates: November 16 - 20, 1998
December 7 - 11, 1998

Inspectors: M. Bielby, RIII Team Leader
J. Hansen, RIII Resident Inspector, LaSalle
R. Langstaff, RIII Reactor Engineer
G. Galletti, NRR Human Factors Assessment Branch

Approved by: Melvyn N. Leach, Chief, Operator Licensing Branch
Division of Reactor Safety

EXECUTIVE SUMMARY

D. C. Cook, Units 1 and 2
Inspection Reports 50-315/98023; 50-316/98023

During Phase 1 of the NRC Restart Readiness Assessment Team Inspection, the inspection team reviewed the readiness of the licensee's emergency operating procedures and the continuing training programs to support a safe unit restart. The inspection team reviewed the licensee's close out of NRC Restart Action Plan 0350 Item 5, "Training Issues." Although the deficiencies were originally identified during an initial licensed operator examination, the licensee elected to also apply many of the corrective actions to the licensed operator requalification training program.

Plant Operations:

- The emergency operating procedure changes and supporting documentation planned for plant restart were still undergoing licensee revision and review during the inspection. Consequently, the inspectors were not able to assess the quality of those documents. Supporting documentation for the existing emergency operating procedures was not adequate to verify expected actions. (Section O3.2)
- The licensee evaluators were critical of crew performance during simulator scenarios. Some crews were not adequately prepared for the simulator evaluations as evidenced by the failure rates during the steam generator tube rupture scenario. The crews' lack of timely actions to isolate auxiliary feedwater and equalize reactor coolant system and steam generator pressures during a tube rupture was a concern. The training material did not adequately address the need for expediency in completing these actions. The inspectors determined that overall operator performance, knowledge, and procedural usage during the "Loss Of All AC Power" scenario was satisfactory, although crew communication problems continued to exist which resulted in the unit supervisor not being fully aware of plant conditions. Common to both scenarios, communications and shift briefs were performance areas identified as needing improvement. (Section O4.2)
- The formation of a dedicated test group to maintain the examination bank and prepare examinations was effective and adequate based on the following inspector reviews and observations: incorporation of examination development guidelines into the training procedure, preparation of initial examinations, and examination bank performance indicators. NRC Restart Action Plan 0350 Item 5.A, "Training staff ability to develop technically accurate examination material in accordance with the examination guidelines," is closed. (Section O5.1)
- Based on the inspectors' review of upgraded training material, procedural clarification and simplification, and satisfactory examination results, the licensee's corrective actions have effectively improved the operators' ability to determine the correct protective action recommendation. NRC Restart Action Plan 0350 Item 5.B, "Operator ability to determine the correct protective action recommendations for an emergency event," is closed. (Section O5.2)

- The implementation of actions concerning the licensee's Action Items and the additional processes including the Curriculum Development Committee and the Academic Review Board effectively improved the preparation of initial license applicants and operators enrolled in continuing training. NRC Restart Action Plan 0350 Item 5.C, "Preparation of applicants for the initial license examination" is closed. (Section O5.3)
- The implementation of actions concerning the licensee's Action Items, and the additional processes including the shift manager report and Academic Review Board had the potential to improve the preparation of operators. However, based on the team's observations of operator performance during continuing training evaluated scenarios, and review of the shift manager report, the actions taken to improve communications were not adequate. NRC Restart Action Plan 0350 Item 5.D, "Applicant Abilities To Communicate And Diagnose Events During Dynamic Simulator Scenarios," is not closed. (Section O5.4)
- The inspectors determined that the overall classroom training provided to the operators was satisfactory. Lesson plans were thorough, and the trainers were well prepared. Operators displayed a questioning attitude during training. A non-cited violation was identified for incomplete corrective actions to a procedure for realignment of seal return flow to the volume control tank. Procedural weaknesses were also identified for lack of guidance and staging of materials to support alignment of firewater as an alternate source of steam generator feed flow, and unclear wording for Response Not Obtained actions delineating placement of excess letdown in service in response to excessive reactor coolant leakage. (Section O5.5)
- The team observed that operators were knowledgeable of the required 10 CFR Part 50 Appendix R actions, and carried out those actions in accordance with the approved procedure. However, several deficiencies with the Appendix-R procedure were identified during the exercise which appeared to be a weakness in the initial verification and validation process used to develop the procedure. (Section O5.6)
- The team determined that the licensee had an adequate program for ensuring that simulator configuration was being maintained consistent with the plant. Simulator discrepancies were addressed in an adequate fashion with consideration given to potential training impact and factors influencing the scope and schedule for such changes. (Section O5.7)

Report Details

I. Operations

O3 Operations Procedures and Documentation

O3.1 General Comments

The inspectors reviewed the licensee's Emergency Operating Procedures (EOPs) during the first week of the inspection using Inspection Procedure (IP) 40500, "Effectiveness of Licensee Controls in Identifying, Resolving, And Preventing Problems," and IP 42001, "Emergency Operating Procedures," as guidance.

O3.2 Emergency Operating Procedures

a. Inspection Scope (40500, 42001)

The inspectors reviewed the status of the licensee's EOP program and scope of procedure changes planned for plant restart. The following documents were considered in the review process:

- C D.C. Cook Plant Specific Technical Guidelines, Revision 1, April 1986
- C Letter AEP-98-168, dated September 21, 1998, Westinghouse EOP Readiness Review

b. Observations and Findings

Based on discussions with the EOP coordinator, the licensee planned to revise 20 emergency operating procedures per unit to support the plant restart. Five of the procedures for each unit were in the process of being significantly revised. The inspectors were not able to verify the quality of the procedure changes because the procedure changes were still being revised and under management review at the time of this inspection.

The licensee initiated the procedure changes to address a number of licensee and NRC identified issues. The inspectors concurred with licensee's determination that the issues needed to be addressed prior to plant restart. The issues included:

- The accident analyses assumed that containment spray would be running for a minimum of 50 minutes for iodine removal. However, the existing EOPs allowed containment spray to be stopped prior to 50 minutes. The issue was licensee identified as a result of its containment spray safety system functional inspection and documented in condition report (CR)-98-2454. The issue was identified as licensee restart item 355.

- The existing EOPs allowed the distributed ignition system (DIS) to be placed in service without containment spray or hydrogen skimmers in service which was contrary to the licensing basis information on DIS operation. The issue was identified in response to questions by the NRC resident inspectors and documented in condition report CR-98-0833. The issue was identified as licensee restart item 2305.
- The existing EOPs did not require the hydrogen recombiners to be started within six hours after an accident which was contrary to the updated safety analysis report (USAR). The issue was identified in response to questions by the NRC resident inspectors and documented in condition report CR-98-0834. The issue was identified as licensee restart item 2306.
- The accident analyses did not include heat inputs from either the hydrogen recombiners or the DIS. The issue was identified by the licensee during resolution of NRC resident inspector issues related to hydrogen control and documented in condition report CR-98-1887. The issue was identified as licensee restart item 3458.

The inspectors noted that supporting documentation for the existing EOPs was inadequate. The existing plant specific technical guideline (PSTG) for the EOPs had not been updated since April 1986; consequently, changes in procedures and accident strategy made since 1986 were not reflected in the PSTG. Based on discussions with the EOP coordinator, the inspectors determined that the licensee planned to develop support documentation for the procedure changes needed for plant restart. The support documentation was intended to describe and address procedure deviations from the Westinghouse Owners Group Emergency Response Guidelines. However, the inspectors were not able to assess the quality of the support documentation being developed because the documentation was still undergoing licensee review at the time of this inspection. The adequacy of EOPs for restart will be assessed during a future inspection (Inspection Followup Item (IFI) 50-315/316-98023-01(DRS)).

c. Conclusions

The EOP procedure changes and supporting documentation planned for plant restart were still undergoing licensee revision and review during the inspection. Consequently, the inspectors were not able to assess the quality of those documents. Supporting documentation for the existing EOPs was not adequate to verify expected actions.

O4 Operator Knowledge and Performance

O4.1 General Comments

The inspectors observed the performance of two plant operating crews during scenario evaluations by members of the licensee's training and operations staffs using IP-71001, "Licensed Operator Requalification Program Evaluation," as guidance.

O4.2 Evaluated Licensed Operator Requalification Dynamic Simulator Scenarios

a. Inspection Scope (71001)

The inspectors observed the performance of two plant operating crews in the Cook Unit 2 simulator. One crew was observed November 18, 1998 (Period 5, Week 5), and the second on December 8 - 9, 1998 (Period 6, Week 1) during their respective continuing training scenario evaluations. The following documents were reviewed during the inspection:

- (Requalification Classroom Lesson Plan) RQ-C-2350, "OHI-4023 and E-0 and E-3 Changes," Revision 1
- (Requalification Evaluation Scenario) RQ-E-2352, "SGTR," Revision 0
- RQ-E-2360, "Loss of All AC Power," Revision 0.
- RQ-E-2361, "Loss of All AC Power," Revision 0
- (Requalification Simulator Lesson Plan) RQ-S-2350, "EOP Training," Revision 0
- (Operations Head Procedures) 02-OHP 4023.E-0, "Reactor Trip Or Safety Injection," Revision 14
- 02-OHP 4023.E-3, "Steam Generator Tube Rupture," Revision 6
- 02-OHP 4023.ECA-0.0, "Loss Of All AC Power," Revision 9
- 02-OHP 4023.ECA-0.1, "Loss Of All AC Power Recovery Without SI Required," Revision 6
- OHI-4023, "Abnormal/Emergency Operating Procedure User's Guide," Revision 6,
- Updated Safety Analysis Report (USAR) Section 14.2.4, Steam Generator Tube Rupture

b. Observations and Findings

Each plant operating crew was divided into four simulator crews that consisted of a shift technical advisor (STA); shift manager (SM); unit supervisor (US); reactor operator (RO); and balance of plant (BOP) operator. Each simulator crew was observed in one scenario by both the licensee evaluators and NRC inspectors. The Period 5 scenarios, RQ-E-2352, "Steam Generator Tube Rupture," were administered after a half day of classroom and half day of simulator training using draft emergency operating procedures 02-OHP 4023.E-0, "Reactor Trip Or Safety Injection," and 02-OHP 4023. E-3, "Steam Generator Tube Rupture." Conversely, the Period 6 scenarios, RQ-E-2360 and -2361, "Loss Of All AC Power," were administered prior to any immediate classroom or training on the main scenario events.

The licensee's evaluators were critical of simulator crew performance during both scenarios. The following common strengths were identified by the licensee evaluators and observed by the inspectors:

- Overall command and control. The US generally maintained a position of authority and oversight, demonstrated good prioritization of tasks, and made use of other unit personnel and auxiliary operators to complete tasks.
- Overall diagnosis of events and performance of immediate procedural actions was generally good.
- The ROs generally did a good job of turnover prior to traversing away from the front panel area, double checking actions, and backing each other up.

The following areas for improvement were identified by the licensee evaluators and observed by the inspectors:

- Communications. The US was not kept informed of steam generator (SG) level, especially when it exceeded the specified band or the BOP operator had difficulty maintaining the level band; US gave detailed, lengthy orders that were difficult to repeat back; persistent alarm noise contributed to difficulty of hearing some orders and information.
- Shift briefs. The start and finish of the shift briefs were not always identified by the Unit Supervisor and were sometimes held at inappropriate times during the major transient. For example, during the steam generator tube rupture event, one crew held a series of three shift briefs before operator actions had been taken to isolate auxiliary feedwater and depressurize the reactor coolant system. During the third shift brief the shift manager questioned whether the timing was appropriate. As a result, the crew failed to complete depressurization of the reactor coolant system before the SG narrow range level exceeded the failure criteria.
- Lack of timely implementation of actions directed by 02-OHP 4023. E-3, "Steam Generator Tube Rupture."

The areas for improvement were identified by the evaluators, and generally self-identified by the respective crew members during post scenario critiques. When appropriate, the individual or crew was remediated and retested at the end of the week.

b.1 Observations and Findings for Steam Generator Tube Rupture Scenario

On November 18, 1998, the inspectors observed the performance of four simulator crews during scenario RQ-E-2352. The evaluated scenario involved a steam generator tube rupture (SGTR) that required isolation of auxiliary feedwater (AFW), cooldown and depressurization of the reactor coolant system (RCS) in a timely manner consistent with the licensee's evaluation criteria. The crews used draft revisions of the emergency operating procedures which were intended to be implemented prior to plant startup. Of

the four crews, one successfully isolated feed water to the ruptured steam generator, cooled down, and depressurized the plant in a timely manner. The other three crews experienced difficulty in completing all of those actions. Two crews failed to control steam generator level within the licensee's established criteria. For the third crew, the licensee's evaluators stopped the simulator scenario prior to the crew achieving stable inventory and pressure control of the RCS plant conditions and control of steam generator level. Subsequently, the inspectors determined the ruptured steam generator would have been overfilled. The inspectors noted several issues which affected the operator's ability to mitigate the increasing ruptured SG level in a timely manner, including:

- On one occasion, the BOP operator mis-diagnosed a stuck open SG power operated relief valve (PORV). A failed upscale SG pressure instrument caused the PORV to initially open and the BOP operator was unable to manually close the valve. A short time later, the RO identified the PORV controller had not been properly placed in the manual operating mode and took the necessary actions to successfully close the PORV.
- The lack of training and early SGTR procedural guidance for maintaining SG level contributed to three of four crews experiencing difficulty in maintaining the ruptured SG level below 90 percent with two of the crews failing the scenario evaluation.

Updated Safety Analysis Report (USAR) Section 14.2.4, Steam Generator Tube Rupture, identified that the major operator actions necessary to recover the plant following an SGTR were identification and isolation of the ruptured steam generator, cooldown and depressurization of the RCS to restore inventory, and termination of safety injection (SI) to stop primary to secondary leakage. The section further stated that primary to secondary leakage would continue after SI flow was stopped until the RCS and ruptured steam generator pressures equalized. Charging flow, letdown, and pressurizer heaters would then be controlled to prevent repressurization of the RCS and reinitiation of leakage into the ruptured steam generator.

Lesson plan RQ-S-2350-HO-2, "EOP Training," which delineated the SGTR EOP mitigating strategies, stated in Part 1 that stopping emergency core cooling systems (ECCS) must be performed expeditiously after ensuring the ECCS termination criteria had been satisfied. The training material also stated that delaying the step would result in RCS repressurization and continued filling of the ruptured SG. Also, lesson plan RQ-C-2350, "OHI-4023 And E-0 And E-0 Changes," discussed the rapid termination of ECCS by the operators to minimize the SG overfill but did not provide any additional information. The inspectors determined that the training material did not provide expectations to the operators regarding maintaining the ruptured SG level at less than 90 percent narrow range. The licensee had determined that maintaining ruptured SG level below 90 percent would ensure that the SG level would remain on scale during an SGTR and was the critical acceptance criteria used in the evaluation scenario. Also, the training material did not discuss the potential for

continued filling of the SG following SI termination if RCS inventory was not balanced, a bubble established in the pressurizer for pressure control, and the RCS depressurized to the ruptured SG pressure.

While providing guidance to equalize pressures between the RCS and the ruptured steam generator, the 02-OHP 4023.E-3 procedure did not identify exceeding 90 percent SG level as a concern until Step 28. This step required the operator to maintain RCS and ruptured SG pressures equal if the ruptured SG narrow range level was greater than 90 percent.

- Operators did not conduct a timely isolation of AFW to the ruptured SG which resulted in SG narrow range levels exceeding 60 percent prior to AFW isolation for two of the evaluated crews. Those crews ultimately failed to complete an evaluation critical task to cooldown and depressurize while maintaining the ruptured SG narrow range level below 90 percent. As a result of failing the critical task, those crews performance was evaluated as unsatisfactory by the licensee evaluators.

The inspectors noted that the foldout page for 02-OHP 4023.E-3 did not provide continuous action guidance to allow for the early isolation of AFW to the ruptured SG once the operator determined which SG was ruptured. Additionally, the simulator feedwater regulating valve (FWRV) hold up circuitry had been modified to match the plant, such that the FWRVs went full open when AFW was initiated and caused the SGs to fill at a faster rate.

- The inspectors observed that one scenario was terminated by licensee evaluators prior to meeting the complete scenario termination criteria for stabilized RCS inventory and leakage into the ruptured SG. Although the scenario criteria for termination of SI by the crew had been met, the inspectors observed simulator conditions that included a pressurizer level of 100 percent, minimum charging pump flow to the RCS, letdown isolated, and RCS pressure 200 psig greater than the ruptured SG pressure. With the SG narrow range level at 87 percent and increasing, the inspectors concluded that the crew would have filled the ruptured SG prior to having inventory and pressure control of the RCS. The licensee evaluated the crew as satisfactory based on their successful completion of all critical tasks; however, the inspectors determined that the crew had not stabilized the plant following the SGTR and would have filled the ruptured SG.

The inspectors determined that the failure to cooldown and depressurize in a timely manner was risk significant based on discussions with an engineer from the licensee's Probabilistic Risk Analysis (PRA) group. Failure to cooldown and depressurize for a SGTR was ranked fifth and eighth in risk significance using Fussell-Vesely and risk achievement worth importance measures, respectively, in the licensee's PRA.

b.2 Observations and Findings for Loss of All AC Power Scenario

On December 8 and 9, 1998, the inspectors observed the licensed operators' performance during scenarios RQ-E-2360 and RQ-E-2361, "Loss of All AC Power." In general, all four simulator crews satisfactorily completed the scenario critical tasks. The licensee's evaluators noted several areas where the crew did not perform as expected and were critical of the crews performance. The inspectors noted several issues including:

- The licensee evaluators and the inspectors observed an instance where the operators failed to implement EOPs as directed by procedure. The operator did not manually start equipment that had not automatically started after receiving a valid, automatic start signal. The BOP operator identified that the turbine driven auxiliary feedwater (TDAFW) pump had failed to automatically start on a valid demand signal and did not manually start the pump. During performance of 02-OHP 4023.E-0, "Reactor Trip Or Safety Injection," the US discussed the failure of the pump to automatically start with the BOP operator and decided not to manually start the pump as AFW flow to the SG was adequate. However, the SM encouraged the US to start the pump as it had failed to automatically start and the US directed the BOP operator to start the pump. After the scenario during evaluator discussions, the licensee stated that the expectation was that the pump would be manually started by the BOP operator during verification of automatic actions following completion of immediate actions. The team noted that manually starting the pump was a procedural requirement rather than an expectation because Step 2.2 of Attachment 2, Rules of Usage for EOP Network, in OHI-4023, "Abnormal/Emergency Operating Procedure User's Guide," directed the operator to manually initiate actions once it was recognized that an automatic action failed to occur. The inspectors reviewed lesson plan RQ-C-2350 and determined that no specific guidance was provided on manually starting equipment which had failed to automatically start.
- The US was not always aware of plant conditions. Following a manual scram due to an anticipated transient without scram (ATWS), the US indicated during a brief that he was not sure of what had initiated the signal that should have caused the automatic scram even though he had given the direction to scram at the recommendation of crew members. The BOP operator then informed the US that he believed the trip signal to be due to a dropped rod. No confirmation of the trip signal was performed prior to manually tripping the reactor. Also, while mitigating a loss of all alternating current (AC) power in accordance with 02-OHP 4023.ECA-0.0, "Loss Of All AC Power," the US directed the BOP operator to maintain SG levels between 26 and 50 percent narrow range indication. The US reiterated the expectations on level maintenance near the end of the scenario; however, the BOP operator still failed to inform the US that narrow range levels in three SGs had exceeded 50 percent.
- Following the reactor trip, the RO informed the US that rod H-8 did not indicate fully inserted as required by the immediate actions of E-0. The rod indicated 25 steps one minute after the trip and eventually decayed to fully inserted over the next four minutes. The inspectors had observed four previous crews respond to

reactor trips; however, this was the first crew to note and respond to the rod H-8 condition. Training personnel indicated that rod H-8 responded in this fashion in the plant and the simulator fidelity had been modeled to mimic the plant following a reactor scram. The licensee had previously determined that the cause of the improper position indication was a permeability problem with a rod drive housing. The licensee had determined that the rod responded appropriately to a reactor trip and raised the rod bottom limit switch setpoint to 38 steps to compensate for the slow reaction of the rod position indication following a reactor trip. The licensee had also completed a safety analysis which concluded that the change did not create an unreviewed safety question. The adequacy of the licensee's corrective actions to address the improper H-8 rod position indication will be assessed during a future inspection. (IFI 50-315/98023-02(DRS); 50-316/98023-02(DRS)).

- The BOP operator had not properly controlled the TDAFW pump discharge feed rate within 02-OHP 4023.ECA-0.0, "Loss Of All AC Power," requirements of less than 340 Kilo pounds mass per hour (Klbm/hr). Although the TDAFW pump discharge flowrate was approximately 440 Klbm/hr at the termination of the scenario, the evaluators did not question the operators knowledge of current plant conditions to determine awareness of the issue. The evaluators later discerned that the operator was aware of the AFW flow conditions but failed to inform the US.

c. Conclusions

The licensee evaluators were critical of crew performance during simulator scenarios. Some crews were not adequately prepared for the simulator evaluations as evidenced by the failure rates during the SGTR scenario. The crews' lack of timely actions to isolate AFW and equalize RCS and SG pressures during a SGTR was a concern. The training material did not adequately address the need for expediency in completing these actions. The inspectors determined that overall operator performance, knowledge, and procedural usage during the "Loss Of All AC Power" scenario was satisfactory, although crew communication problems continued to exist which resulted in the US not being fully aware of plant conditions. Common to both scenarios communications and shift briefs were performance areas identified as needing improvement.

O5 Operator Training and Qualification

O5.1 Review Of NRC Restart Action Plan 0350 Item 5.A, "Training Staff Ability To Develop Technically Accurate Examinations In Accordance With Guidelines"

a. Inspection Scope (71001)

The team reviewed NRC Restart Action Plan 0350 Item 5.A regarding the training staff's ability to develop technically accurate examination material in accordance with the examination guidelines.

b. Observation and Findings

b.1 Documented Licensee Actions

The team reviewed the following documented information, as described by Training Department Strategy No. 5267 of licensee Restart Issue No. 8765, regarding development of technically accurate examination material:

b.1.1 Action Item 1.1.a - Establish Operations Training Test Group

Action Item 1.1.a required the Operations Training Test Group (OTTG) be established to develop, review, and maintain the operator examination banks. The purpose of the OTTG is to maintain the examination banks by systematically collating, reviewing, revising, and adding questions. Additionally, the OTTG will generate: weekly written quizzes, evaluation scenarios, and job performance measures (JPMs); annual licensed operator requalification examinations; and NRC initial licensed operator examinations.

b.1.2 Action Item 1.1.b - OTTG Examination Development Training

Action Item 1.1.b required training on examination development be provided for all members of the OTTG.

b.1.3 Action Item 1.1.c - Proceduralize Examination Development Guidelines

Action Item 1.1.c required the Training Administrative Manual (TAM) 3.03.05, "Training Program Management Plan," Revision 6, be revised to incorporate examination development guidelines that paralleled and referenced NUREG-1021 Interim Revision 8, "Operator Licensing Examination Standards for Power Reactors." The guidelines were piloted during the Requalification Year 22 annual licensed operator examinations and implemented in draft by the OTTG during the periodic licensed operator requalification examinations. TAM 3.03.05, Revision 7, was approved with an effective date of November 23, 1998.

b.1.4 Action Item 1.1.d - Develop Examination Performance Indicators

Action Item 1.1.d required performance indicators be identified and tracked to monitor the quality of questions and examinations generated by the OTTG.

b.1.5 Action Item 1.1.e - Question Writing Techniques Continuing Training

Action Item 1.1.e required training on question writing techniques be provided for the OTTG as part of its Instructor Continuing Training. The training was also evaluated to determine applicability for all operations instructors.

b.1.6 Action Item 1.1.g - Conduct Instructor Training Needs Analysis

Action Item 1.1.g required an analysis be conducted to identify instructor training needs for the operations section of instructor continuing training.

b.2 Team Review of Documented Licensee Actions

The licensee completed its closeout of Items O5.1.b.1.1 - b.1.6 (licensee restart Action Items 1.1.a - e and 1.1.g). The inspectors interviewed members of the OTTG and verified they were experienced onsite training instructors who had received additional training on examination development and question writing in the form of seminars and workshops conducted onsite and at another facility. The inspectors reviewed TAM 3.03.05 and verified the OTTG was a dedicated examination maintenance and generation group for both the initial license and licensed operator requalification training programs. TAM 3.03.05 clearly defined the OTTG responsibilities and appeared to provide the necessary guidance for the OTTG to accomplish its assigned tasks by incorporating examination development guidelines that paralleled NUREG-1021. The group was tasked with continually reviewing, revising, and refreshing the examination bank to ensure the defined operator tasks are evaluated by current written questions, JPMS, or scenarios. The team interviewed management and inspected the secure examination facilities to verify the OTTG had adequate staffing, resources, and management support to perform its function. The inspectors noted that previous examinations developed by the OTTG for Requalification Year 22 and a 1998 initial license retake written examination had been identified as satisfactory in previous NRC inspection reports.

The team reviewed examination bank performance indicators which were tracked to monitor the corrective and preventative actions each training period. The performance indicators included: exam bank status for reviewing, revising, and replacing questions; quiz results for ROs, SROs, and crews; management observations of training by operations, training, and senior management; class attendance for ROs, SROs, instructors, and crews; and period contact time for simulator, classroom, and self study. The inspectors identified the performance indicators provided immediate feedback to the OTTG and the trends indicated the actions taken to improve development of examination material were effective.

c. Conclusions

The formation of a dedicated test group to maintain the examination bank and prepare examinations was effective and adequate based on the following inspector reviews and observations: incorporation of examination development guidelines into the training procedure; preparation of initial examinations; and examination bank performance indicators. NRC Restart Action Plan 0350 Item 5.A, "Training staff ability to develop

technically accurate examination material in accordance with the examination guidelines“ is closed.

O5.2 Review Of NRC Restart Action Plan 0350 Item 5.B, “Operator Ability To Determine The Correct Protective Action Recommendations For An Emergency Event”

a. Inspection Scope (71001)

The team reviewed NRC Restart Action Plan 0350 Item 5.B regarding licensed operators’ ability to determine the correct protective action recommendations (PARs) for an emergency event.

b. Observation and Findings

b.1 Documented Licensee Actions

The team reviewed the following documented information, as described by Training Department Strategy No. 5267 of licensee Restart Issue No. 8765, regarding operator ability to determine the correct PAR during an emergency event:

b.1.1 Action Item 1.2.a - Protective Action Recommendation Remediation Training

Action Item 1.2.a required all operators to successfully perform a PAR in a job performance measure (JPM) format during the Year 22 annual licensed operator requalification examination. An emergency plan workbook was used to conduct licensed operator requalification training during Period 1 of Year 23. Additional licensed operator requalification training to review PAR procedure changes was conducted during Period 5 of Year 23.

b.1.2 Action Item 1.2.d - Clarify Protective Action Recommendation Procedure

Action Item 1.2.d developed changes that clarified and simplified the PAR procedure. Recommendations were submitted to the emergency planning group.

b.2 Team Review of Documented Licensee Actions

The licensee completed its closeout of Items O5.2.b.1.1 - b.1.2 (licensee restart Action Items 1.2.a and d). The team reviewed the following documentation: (1) results of a JPM that incorporated a PAR during the Requal Year 22 annual examination; (2) procedure PMP-2080 EPP.105, “General Emergency,” Revision 4; (3) lesson plan RQ-C-2351, “Protective Action Recommendation Review,” Revision 0, taught during Requalification Year 23, Period 5; (4) results of PAR questions asked on Requalification Year 23, Period 5 quizzes.

The inspectors reviewed Requalification Year 22 annual examination results for a JPM that had incorporated a PAR and identified that 9 of 10 SROs correctly performed the task. During Period 1 of Requalification Year 23, training on PARs (lesson plan RQ-I-2311) was conducted using an Emergency Plan Workbook. Revisions to PMP-2080

EPP 105, "General Emergency," were completed and incorporated the following: (1) a simplified version of the Core Melt Sequence PAR Flowchart based on guidance in NUREG/BR-0150 (RTM-96), (2) a revised Dose Projection PAR Flowchart, and (3) simplified procedural steps for the PAR determination process. The inspectors verified that during Requalification Year 23, Period 5, training was conducted using lesson plan RQ-C-2351 which incorporated the revised PMP 2080 EPP 105. The Requalification Year 23, Period 5, weekly quizzes incorporated at least one discriminating PAR question which was correctly answered by 47 of 48 SROs.

c. Conclusions

Based on the inspectors review of upgraded training material, procedural clarification and simplification, and satisfactory examination results, the licensee's corrective actions have effectively improved the operator's ability to determine the correct PAR. NRC Restart Action Plan 0350 Item 5.B, "Operator ability to determine the correct protective action recommendations for an emergency event" is closed.

O5.3 Review Of NRC Restart Action Plan 0350 Item 5.C, "Preparation Of Applicants For The Initial License Examination"

a. Inspection Scope (71001)

The team reviewed NRC Restart Action Plan 0350 Item 5.C regarding the licensee's preparation of applicants to take an NRC administered initial license operator examination.

b. Observation and Findings

b.1 Documented Licensee Actions

The team reviewed the following documented information, as described by Training Department Strategy No. 5267 of licensee Restart Issue No. 8765, regarding preparation of applicants to take an NRC administered initial license operator examination:

b.1.1 Action Item 1.3.c - Clarify Management Responsibilities for Instructor Accountability

Action Item 1.3.c required the company standards be reviewed for conduct and expectations of professionalism for instructors. A clarification of management responsibilities for instructor accountability was established based on the process used to monitor instructor performance.

b.1.2 Action Item 1.3.d - Clarify Management Responsibilities for Student Accountability

Action Item 1.3.d required the company standards be reviewed for conduct and expectations of professionalism for students. A clarification of management responsibilities for student accountability was established based on the process used to monitor student performance.

b.1.3 Action Item 1.3.e - Identify Instructor Training Needs

Action Item 1.3.e required an analysis be conducted to identify instructor training needs for the operations section of instructor continuing training.

b.2 Team Review of Documented Licensee Actions

The licensee completed its closeout of Items O5.3.b.1.1 - b.1.3 (licensee restart Action Items 1.3.c - e). The team reviewed the following documentation associated with the action items: (1) OTP.001, "Operations Training Values And Expectations," Revision 0; (2) OHI-2070, "Operations Training And Qualification," Revision 12; (3) TAM 2.05.01, Attachment 5, "Management Evaluation Of Training," Revision 5.

The team verified that a management review of OTP.001 with training instructors, and of OHI-2070, Section 4.10.2, "Conduct of Training," with students had been conducted to reinforce conduct and professionalism expectations. The licensee developed a management observation form, TAM 2.05.01, Attachment 5, to monitor instructor and student performance, and to ensure accountability. The inspectors reviewed a sample of completed management observation forms and identified that the process provided reasonable assurance of line management's participation in its respective program training evaluations. However, the inspectors also identified that the management comments did not provide meaningful feedback to adequately assess the management rating of the key characteristics of quality training as listed on the form. Subsequently, the team observed a Program Review Committee (PRC) meeting in which the senior management independently recognized the apparent lack of assessment of the management observations and directed the staff to perform such an evaluation for discussion at the next scheduled PRC meeting regarding operator training.

The inspectors reviewed CR 97-2406 which was written to address the high failure rate and lack of preparation of the RO-19 initial license applicants. A thorough root cause investigation identified nine preventive actions which were incorporated into the licensee's action item list. The inspectors noted that all four RO-19 licensed operator candidates who retook the initial license examinations and passed were identified as well prepared by the NRC examiners. Although the number of operator retake examinations was small and the preparation time was longer than normal, the candidate preparedness was considered an indication of improvement that had occurred in the training program.

The licensee implemented additional processes to improve the training and a preparedness of licensed operators. The inspectors reviewed minutes and a description of the Curriculum Development Committee (CDC) process in OHI 2070, Section 4.17. The operations CDC normally met once each training cycle to select training topics for continuing training, identify training improvements and needs, and review operating experience. The meetings were attended by operations and training management and staff with the shift manager serving as the chairperson. A CDC meeting for the next initial license training class (RO-20) was convened to identify, analyze, and correct problems encountered by the RO-19 initial license training class.

The inspectors reviewed a description of the Academic Review Board process described in OHI 2070, Section 4.11. The inspectors identified that specific criteria based on individual operator performance or behavior characteristics in either the initial license or continuing training programs allowed either the Operations Manager or Operations Training Supervisor to convene the Academic Review Board at their discretion to develop a plan of action or remediation.

c. Conclusions

The implementation of actions concerning the licensee's Action Items 1.3.c and d, and the additional processes including the CDC and the Academic Review Board effectively improved the preparation of initial license applicants and operators enrolled in continuing training. NRC Restart Action Plan 0350 Item 5.C, "Preparation of applicants for the initial license examination" is closed.

O5.4 Review Of NRC Restart Action Plan 0350 Item 5.D, "Applicant Abilities To Communicate And Diagnose Events During Dynamic Simulator Scenarios"

a. Inspection Scope (71001)

The team reviewed NRC Restart Action Plan 0350 Item 5.D regarding the initial license applicants' abilities to communicate and diagnose events during the initial license operator dynamic simulator scenario examination.

b. Observation and Findings

b.1 Documented Licensee Actions

The team reviewed the following documented information, as described by Training Department Strategy No. 5267 of licensee Restart Issue No. 8765, regarding the initial license applicants' abilities to communicate and diagnose events during the initial license operator dynamic simulator scenario examination:

b.1.1 Action Item 1.4.a - Formalize Operator Selection and Evaluation

Action Item 1.4.a required a formal and comprehensive licensed operator candidate selection and ongoing evaluation process be developed.

b.1.2 Action Item 1.4.b - Conduct Instructor Training Needs Analysis

Action Item 1.4.b required an analysis be conducted to identify instructor training needs for the operations section of instructor continuing training.

b.2 Team Review of Documented Licensee Actions

The licensee completed its closeout of Items O5.4.b.1.1 - b.1.2 (licensee restart Action Items 1.4.a - b). As part of its corrective actions, the licensee assigned a Shift Manager (SM) to training to ensure consistent application of operations management

expectations and standards associated with operator competencies. The SM generated a report to operations staff and management after each training period. The inspectors reviewed the SM Report for Period 5 simulator evaluation observations. The inspectors determined that the report was not discussed or defined in the licensee's administrative procedures and was of limited use to operations shift personnel as it was merely a compilation of evaluation comments. The report did not address the areas of communications and event diagnosis although the scenario evaluators had made specific comments pertaining to these areas. The SM's evaluative summary was very positive regarding overall operator performance; however, the inspectors had concluded that the performance of the crews they observed (Section 4.2) during the Period 5 scenarios, RQ-E-2352, "Steam Generator Tube Rupture," were poor with two of four crews failing and a third crew nearly failing. The licensee had identified additional crew and individual failures during previous evaluations not observed by the inspectors. The licensee initiated actions to define the Shift Manager Report expectations in OHI-2070, "Operations Training and Qualification" including the grouping the evaluation comments by competencies defined in NUREG 1021 to make conclusions more useful in identifying and correcting deficiencies.

Simulator evaluations were periodically conducted on individuals and crews in the continuing training program at the beginning of the training week. The assessment included diagnostics and communications skills. If a crew or individual was determined to be unsatisfactory, they were remediated and re-examined prior to returning to shift. The process was documented in TAM 3.03.05, "Operations Training Program Examination Requirements," Revision 7. As part of an ongoing evaluation process, the licensee identified criteria based on an individual operator's performance deficiencies or behavior that could result in an Academic Review Board which could recommend a plan of corrective action, or remove the individual from license duties. The process was documented in OHI-2070, "Operations Training And Qualification," Revision 12.

c. Conclusions

The implementation of actions concerning the licensee's Action Items 1.4.a and b, and the additional processes including the SM report and Academic Review Board has the potential to improved the preparation of operators. However, based on the team's observations of operator performance during continuing training evaluated scenarios (Section 4.2), and review of the SM report, the actions taken to improve communications were not adequate. NRC Restart Action Plan 0350 Item 5.D, "Applicant Abilities To Communicate And Diagnose Events During Dynamic Simulator Scenarios," is not closed.

O5.5 Classroom Training Lectures

a. Inspection Scope (71001)

The team observed the following classroom training sessions:

- AE-C-2361, "Auxiliary Feedwater - Manual Operations"

- RQ-C-2361, “EOP/AOP Selected Topics”

b. Observations and Findings

The team observed the licensee’s classroom lecture, AE-C-2361, “Auxiliary Feedwater - Manual Operations.” The presentation was direct and concise and covered the pertinent system features that involved manual operator actions. The lecture closely followed the learning objectives described in the lesson plan. The operators were engaged in the lesson by the instructor through a consistent use of questioning. The lesson instruments included a series of photographs of selected as-built system components, a schematic of the overall system, and a written system description. In general the team found the lecture informative. However, the team noted that the licensee had installed a dedicated fire-protection system which was capable of being cross-tied into the AFW system as a potential water source should other feedwater supply contingencies fail. Although the direction to use the fire protection system was incorporated into the licensee’s EOPs, the manual actions required to perform the alignment were not covered in the lesson plan. In addition, the team determined that the actual equipment necessary to perform the actions were not staged at the appropriate plant location.

The team attended a licensed operator classroom training session RQ-C-2361, “EOP/AOP Selected Topics.” The lesson plan provided guidance on loss of secondary heat sink and excessive reactor coolant leakage. The lesson plan thoroughly covered the events and the instructor engaged the operators in discussions. The operators were attentive and displayed a good questioning attitude. However, the team identified the following concerns:

- The lesson plan discussed the implementation of the Response Not Obtained (RNO) columns for Steps 10 and 11 of 02-OHP 4022.002.020, “Excessive Reactor Coolant Leakage,” Revision 0. The RNO step directed the operator to place the excess letdown system in service if desired. Section IV, Step O of RQ-C-2361 indicated that “if desired” as used in the OHP meant that the excess letdown system was available to be put into service and that it was not currently in service. Step O stated that “if desired” implied a choice but the choice was not to go to the next step but rather to complete the RNO. During previous simulator scenarios, the operators had incorrectly implemented the steps by omitting the RNO step if they did not “desire” to put excess letdown in service. This resulted in the remainder of the RNO not being completed which included isolating letdown and the charging header. The operators had not challenged the procedure wording or required that the step be reworded to say what was expected.
- The RNO of Steps 10 and 11 from 02-OHP 4022.002.020 required the operation of 2-CS-369, Seal Water Heat Exchanger to Volume Control Tank, and 2-CS-370, Seal Water Heat Exchanger to Charging Pump Suction, to align the seal leakoff to the volume control tank (VCT). An operator in the class questioned whether the steps were correct because the operator recalled that similar steps had been removed from 01 and 02-OHP 4021.003.001, “Letdown,

Charging and Seal Water Operation,” Revision 20, as corrective actions to Significant Operating Event Report (SOER) 97-01. The SOER described concerns regarding steam binding of the charging pumps and potential corrective actions. The operator also stated that the revision of the OHP was determined to be a plant restart requirement. The operator committed to resolving the issue and initiated a procedure change request. The inspectors reviewed SOER 97-01, associated licensee condition reports, and procedures where the applicable valves were repositioned. The inspectors determined that the licensee had delineated corrective actions which included the option to realign seal return flow to the VCT be removed from 01-OHP 4021.003.001 to minimize the possibility of steam binding the charging pumps following an SI. However, operations department personnel did not perform a thorough review of other operating procedures which resulted in 01 and 02-OHP 4022.002.020 not being revised to remove the inappropriate steps. The licensee’s failure to implement adequate corrective actions to ensure that the procedure was revised is a violation of 10 CFR 50, Appendix B, Criterion 16 (50-316/98023-03(DRS)). This non-repetitive, licensee-identified and corrected violation is being treated as a Non-Cited Violation, consistent with Section VII.B.1 of the NRC Enforcement Policy.

The inspectors identified other inconsistencies in 01 and 02-OHP 4021.003.001 regarding placement of sealing devices on CS-369 and CS-370 which indicated a lack of attention to detail during procedure revision. The licensee had provided classroom and simulator training on SOER 97-01 during the current training cycle. The inspectors determined the training material adequately addressed the steam binding issue and that the operators were knowledgeable of the concern.

- The RNO of Step 24 from 02-OHP 4023.FR-H.1, “Response to Loss of Secondary Heat Sink,” Revision 7, directed the operator to attempt to restore steam generator feed flow using various systems including fire water. However, the inspectors determined that no procedures existed for this evolution and no materials were staged to support performance. The inspectors determined that the firewater system was not used as an emergency source of water in the accident analysis.

c. Conclusions

The inspectors determined that the overall classroom training provided to the operators was satisfactory. Lesson plans were thorough, and the trainers were well prepared. Operators displayed a questioning attitude during training. A non-cited violation was identified for incomplete corrective actions to a procedure for realignment of seal return flow to the volume control tank. Procedural weaknesses were also identified for lack of guidance and staging of materials to support alignment of firewater as an alternate source of steam generator feed flow, and unclear wording for Response Not Obtained actions delineating placement of excess letdown in service in response to excessive reactor coolant leakage.

O5.6 Conduct of Inplant Exercise

a. Inspection Scope (71001)

The team observed an inplant Appendix R, Fire-protection, exercise conducted by the licensee.

b. Observations and Findings

The team observed an inplant Appendix R, Fire-protection, exercise conducted by the licensee on one of the operating crews that included both licensed and non-licensed operators. Crew members were assigned to two person teams. Several members of the licensee's training staff participated in the exercise. The exercise was directed from the auxiliary control room with each team dispatched via radio communications from the auxiliary unit operator quarters. Overall the licensee's crew adequately performed the required activities. The operators were knowledgeable of the required actions, and carried out those actions in accordance with the approved procedure.

Following the exercise, the training department staff conducted a debrief with the crew to identify any barriers to adequate performance. During the debrief, several weaknesses with the Appendix-R procedure were identified including: (1) mis-identification of the starting and ending locations for the LTI-1-3 "Local Generator Output BKR Trip and Isolation;" and (2) incorrect descriptions of the LS-2-1 and LS-2-2 AFW Cross-tie breakers within the exercise tracking sheet. The licensee promptly initiated a procedural change request to correct the deficiencies.

c. Conclusions

The team observed that operators were knowledgeable of the required Appendix R actions, and carried out those actions in accordance with the approved procedure. However, several deficiencies with the Appendix-R procedure were identified during the exercise which appeared to be a weakness in the initial verification and validation process used to develop the procedure.

O5.7 Simulator Fidelity

a. Inspection Scope (71001)

As part of the assessment of the ability of the licensee to develop technically accurate training materials, the team reviewed the licensees administrative controls governing simulator fidelity to ensure that it accurately represented the as-built plant. The team's assessment was based on a review of: (1) the licensee's simulator configuration, change, and control procedure, TAM 6.05, "Simulator Configuration Control," Revision 3, (2) a sample of meeting minutes from the Simulator Configuration Review Board (SCRB), (3) the current simulator deficiency database, and (4) a sample of plant

modifications completed during the current outage to ensure adequate capture in the deficiency database.

b. Observations and Findings

The team determined that the administrative controls governing simulator configuration, change, and control were adequate to maintain the simulator a technically accurate training tool. Criteria governing both the training impact (i.e., impact of the discrepancy on the ability to meet the training objectives) and the configuration change considerations (i.e., those factors which determine the scope of the change and schedule) were explicit. A review of the current database of simulator discrepancies against a sample of recent plant modifications indicated that the changes were adequately captured in the discrepancy database and rank-ordered consistent with the training impact and configuration considerations criteria. Additionally, the team reviewed a sample of the SCRB meeting minutes and discussed the issues addressed in the minutes with the licensee's simulator discrepancy database coordinator. Based on the review, the team determined that the SCRB was capturing and reviewing pertinent simulator configuration issues in a timely fashion and dispositioning those issues in accordance with its administrative guidelines.

c. Conclusions

The team determined that the licensee had an adequate program for ensuring that simulator configuration was being maintained consistent with the plant. Simulator discrepancies were addressed in an adequate fashion with consideration given to potential training impact and factors influencing the scope and schedule for such changes.

O8 Miscellaneous Operations Issues

- O8.1 (Closed) Violation 50-315/316-97003-01: Failure to follow procedure Plant Manager Instructions (PMI) 2011. This item was inadvertently identified as closed in NRC inspection report 98003. The team verified the corrective actions described in the licensee's response letters, dated June 30, 1997 and September 26, 1997, to be reasonable and complete. No similar problems were identified.
- O8.2 (Closed) Violation 50-315/316-97003-02: Failure to conduct comprehensive licensed operator requalification examinations. This item was closed in NRC inspection report 98003, but incorrectly identified as 50-315/316-97003-01. Details of the corrective actions taken were addressed in the licensee's response letters, dated June 30, 1997 and September 26, 1997, and documented in Sections O5.3.1 and O8.1 of NRC inspection report 98003.

V. Management Meetings

X1 Exit Meeting Summary

The team leader presented the inspectors' observations and findings to members of the licensee's management on December 11, 1998. The licensee acknowledged the findings presented and confirmed that all proprietary information reviewed during the inspection had been returned.

PARTIAL LIST OF PERSONS CONTACTED

American Electric Power

G. Arent, Licensing
D. Cooper, Plant Manager
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INSPECTION PROCEDURES USED

IP 71001	Licensed Operator Requalification Program Evaluation
IP 40500	Effectiveness of Licensee Controls in Identifying, Resolving, and Preventing Problems
IP 42001	Emergency Operating Procedures

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-315/316-98023-01(DRS)	IFI	Verify the quality and adequacy of the licensee's EOPs prior to plant restart.
50-315/316-98023-02(DRS)	IFI	Verify the adequacy of the licensee's corrective actions to address improper H-8 rod position indication.

Closed

50-315/316-97003-01(DRS)	VIO	Failure to follow procedure Plant Manager Instructions (PMI) 2011.
50-315/316-97003-02(DRS)	VIO	Failure to conduct comprehensive licensed operator requalification examinations.
50-315/316-98023-03(DRS)	NCV	Incomplete corrective actions for alignment of seal leakoff to the volume control tank incorporated into 02-OHP 4022.002.020.

LIST OF ACRONYMS USED

AFW	Auxiliary Feedwater
AOP	Abnormal Operating Procedure
ATWS	Anticipated Transient Without Scram
BOP	Balance Of Plant
CDC	Curriculum Development Committee
CFR	Code of Federal Regulations
CR	Condition Report
DIS	Distributed Ignition System
DRP	Division of Reactor Projects
DRS	Division of Reactor Safety
ECCS	Emergency Core Cooling Systems
EOP	Emergency Operating Procedure
FWRV	Feedwater Regulating Valve
IFI	Inspection Followup Item
IP	Inspection Procedure
IR	Inspection Report
JPM	Job Performance Measure
LCO	Limiting Condition for Operation
NRC	Nuclear Regulatory Commission
OHI	Operations Head Instruction
OHP	Operations Head Procedure
OTTG	Operations Training Test Group
PAR	Protective Action Recommendation
PORV	Power Operated Relief Valve
PRA	Probabilistic Risk Analysis
PSTG	Plant Specific Technical Guideline
RCS	Reactor Coolant System
RNO	Response Not Obtained
RO	Reactor Operator
SCRB	Simulator Control Review Board
SM	Shift Manager
SG	Steam Generator
SGTR	Steam Generator Tube Rupture
SI	Safety Injection
SOER	Significant Operating Experience Report
SRO	Senior Reactor Operator
STA	Shift Technical Advisor
TAM	Training Administrative Manual
TDAFW	Turbine Driven Auxiliary Feedwater
TS	Technical Specification
USAR	Updated Safety Analysis Report
US	Unit Supervisor
VCT	Volume Control Tank
VIO	Violation